

REMARKS

Claims 1-12 are all the claims pending in the application.

Claims 10-12 have been withdrawn as the result of a restriction requirement.

Claims 1-4 and 10-12 have been canceled without prejudice or disclaimer.

Claim 5 has been amended to further clarify the claimed invention.

New claims 13-19 have been added to provide additional claim coverage.

PRIOR ART REJECTIONS

Claims 5 through 9 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Chakrovorty (U.S. Patent No. 6,181,569) in view of Qi (U.S. Patent No. 6,774,497) and/or in view of Lance (U.S. Patent No. 5,697,148) and/or Ho (U.S. Patent No. 6,849,955). Applicants traverse these rejections because the cited references fail to disclose or suggest all of the claim limitations. Specifically, at least the following limitations are not disclosed or suggested:

a plurality of bond pads on an upper surface of integrated circuit chip, wherein each of said bond pads is aligned in a central row, and

a plurality of conductive bumps formed on the plurality of bond pads;

As explained in Paragraph 9 of the patent specification, a problem associated with the individual mounting of a singulated IC chip onto a substrate is the difficulty of balancing the IC chip on a single, central row of bumps. The present claimed invention overcomes this problem by mounting an array of chips with center row(s) of bumps on a substrate so that balance can be

achieved. This also enables multiple chips to be handled and processed together, rather than individually, thereby making the process more efficient and less costly [paragraph 28].

Chakravorty describes providing first metal bumps on a wafer, depositing encapsulant over the metal bumps, polishing to expose top surface of the metal bumps. Second metal bumps are provided over the exposed first metal bumps and the wafer is singulated into individual chips. Chakravorty, however, does not disclose or suggest mounting the wafer or an array of integrated circuit chips with center rows of bumps onto a substrate.

Qi et al. discloses mounting a chip with bumps onto a substrate, but does not disclose mounting an array of chips with center rows of bumps onto the substrate. Although Figs. 4 and 5 and their associated description describe a bumped wafer with wafer applied underfill, the wafer is subsequently singulated before mounting each unit onto a substrate. Qi et al. is silent on mounting a wafer or an array of integrated circuit chips onto a substrate.

Neither Chakravorty or Qi et al. describe the problem of balancing a center row bumped chip onto a substrate. Nor do they disclose the advantageous technical effect of mounting an array of integrated circuit chips with center row bumps onto a substrate and processing them as multiple units. The skilled artisan, with knowledge of the cited prior art would therefore be unable to arrive at the present invention as defined by amended claim 5 due to the lack of guidance from these disclosures. It is therefore submitted that amended claim 5 and its dependent claims are inventive over the cited prior art. In addition, new claims 14-19 should be allowable for similar reasons.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appl. No.: 10/581,395

Attorney Docket No.: Q78657

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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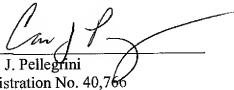
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23373

CUSTOMER NUMBER

Date: December 10, 2009

Respectfully submitted,



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